

Expedited Procedure Under 37 C.F.R. §1.116
Examining Group 1797
Application No. 10/519,584
Paper Dated: February 2, 2009
In Reply to USPTO Correspondence of October 31, 2008
Attorney Docket No. 1217-045998

REMARKS

Claims 1-2 and 4-9 are pending, with claim 1 being the sole independent claim. Claim 1 has been amended to clarify that the exhaust gas purifying catalyst-supported member comprises a metal carrier and a catalyst layer wherein the catalyst layer **consists essentially of** an exhaust gas purifying catalyst and silicon oxide. Support for this amendment is provided in the originally filed specification. New claim 9 clarifies that the silicon oxide functions as a binder. Support for this amendment is provided in the specification at page 4, lines 6-9 and on page 10, lines 15-18.

No new matter has been added.

It is respectfully requested that this Amendment be entered as it does not introduce new issues that require further search and/or consideration, as the issues of the catalyst layer being formed from an exhaust gas purifying catalyst and silicon oxide as well as the issue of the silicon oxide acting as a binder has been discussed throughout the prosecution of the present application. The Examiner's attention is directed to paragraph 2 of the final Office Action in which the use of the transitional term "comprising" is discussed. In view of the Examiner's comments, this transitional term has been changed to "consisting essentially of" to exclude the additional **essential** components taught by the cited references. With respect to new claim 9, which states that the silicon oxide acts as a binder, this claim is being submitted in response to the newly cited Shiraishi references. Since these references are newly cited in the final Office Action, Applicants have not had a chance to respond to these references. Accordingly, it is respectfully requested that this Amendment be entered as the binding action of the silicon oxide is discussed throughout the application and claim 9 is being submitted in response to the teachings of the Shiraishi references.

The Examiner's reconsideration is respectfully requested in light of the amendments made herein, taken with the following remarks.

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RESPONSE TO REJECTIONS

The present invention is directed to an exhaust gas purifying catalyst-supported member comprising a metal carrier and a catalyst layer directly formed on a surface of the metal carrier, wherein the catalyst layer **consists essentially of** an exhaust gas purifying catalyst and silicon oxide, wherein the weight ratio between the exhaust gas purifying catalyst and silicon oxide in the catalyst layer is in the range of 10:90 to 40:60 and 20:80 to 40:60, respectively. It has been found that the use of a catalyst layer which is rich in silicon oxide, such as that which is within the claimed range, remarkably enhances the adhesion properties of the catalyst layer to the metal carrier as the silicon oxide functions as a **binder** for the catalyst layer to the carrier. This adhesion of the catalyst layer occurs without a substantial decrease of the catalytic activity of the catalyst layer. The catalyst of the present invention is a “three way catalyst” that is used for purifying exhaust gas from internal combustion engines of automobiles or the like, wherein these gases include carbon monoxide, incomplete combustion hydrocarbon, and nitrogen oxide (CO, HC and NO_x) which are purified at the same time and thus contain a noble metal.

Claim 1 is finally rejected under 35 U.S.C §102(b) as being anticipated by newly cited reference JP 05-200288A to Shiraishi et al. or newly cited reference JP 05-200287A to Shiraishi et al. (hereinafter referred to as “the Shiraishi references”).

The Office Action asserts that the Shiraishi references disclose an exhaust gas purifying catalyst-supported member comprising a metal carrier and a catalyst layer directly formed on a surface of the metal carrier wherein the catalyst layer comprises an exhaust gas purifying catalyst and a silicon oxide within the claimed ranges. The Office Action also asserts that the Shiraishi references teach that the catalyst layer comprises at least one noble metal selected from the group consisting of platinum, palladium and rhodium, and activated alumina.

Applicants respectfully traverse this rejection.

The Shiraishi references teach a catalyst layer that includes an alkaline earth metal oxide (Abstract-0.1-50g alkaline earth metal oxide). Claim 1 has now been amended to distinguish over the teachings of the Shiraishi references as it recites a catalyst layer **consisting essentially of** an exhaust gas purifying catalyst and silicon oxide and the exhaust gas purifying

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catalyst in the catalyst layer consisting of at least one noble metal selected from the group consisting of platinum, palladium and rhodium, and activated alumina. Accordingly, the alkaline earth metal oxide taught by Shiraishi is excluded from claim 1. As previously argued, the use of alkaline earth metals leads to lowering catalytic oxidation performance.

The Shiraishi references teach that the silicon oxide is used as a catalytic active component. The Examiner's attention is directed to the Abstract and claim 1 of the Shiraishi references which disclose a catalytic active component that consists of palladium, alkaline earth metallic oxide, cerium oxide, zirconium oxide and **silicon oxide**.

In contrast thereto, the present invention teaches that the silicon oxide cannot become an exhaust gas purifying catalyst directly, but by introducing it into the catalyst layer, **a binding action occurs**. (Note especially page 4, lines 4-19 of the originally filed specification). Accordingly, the silicon oxide is used as a binder and has no catalytic action. In order to further distinguish the present invention over the teachings of the Shiraishi references, new claim 9 is being submitted herewith that clarifies that the silicon oxide acts as a binder.

As such, the Shiraishi references fail to teach or suggest the amended claim 1 and new claim 9 and, thus, the invention of amended claim 1, as well as new claim 9, is novel over the teachings of the Shiraishi references. In view of the amendments to the claims and the arguments set forth above, it is respectfully requested that the rejection of claim 1 under 35 U.S.C §102(b) be withdrawn as neither JP 05-200288A to Shiraishi et al. or JP 05-200287A to Shiraishi et al. teach each and every feature of the claim.

Claims 1, 2, 4-5, and 7-8 are finally rejected under 35 U.S.C. §102(b) as being anticipated by United States Patent Number 5,756,057 to Tsuchitani et al. (hereinafter referred to as "Tsuchitani").

The Office Action asserts that Tsuchitani teaches each and every limitation of the claims. In particular, the Office Action asserts that Tsuchitani shows a metal carrier and a three-way catalyst slurry that may be directly formed on a surface of the metal carrier wherein the catalyst layer comprises an exhaust gas purifying catalyst and silicon oxide. The Office Action relies on col. 13, lines 5-20 of the references to assert that the weight ratio between the

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exhaust gas purifying catalyst and silicon oxide in the catalyst layer is in the range of 10:90 to 40:60, and the exhaust gas purifying catalyst in the catalyst layer comprises at least one noble metal selected from the group consisting of platinum, palladium and rhodium, and activated alumina.

Applicants respectfully traverse the rejection for the following reasons.

Claim 1 has been amended to require that the exhaust gas purifying catalyst in the catalyst layer **consists of at least one noble metal selected from the group consisting of platinum, palladium and rhodium, and activated alumina.** Claim 1 has been further amended to require that the catalyst layer **consists essentially of an exhaust gas purifying catalyst and silicon oxide.**

Tsuchitani relates to a method for removal of nitrogen oxides from exhaust gas using a catalyst wherein the alkaline earth metals such as magnesium, calcium, strontium and barium or compounds thereof in the catalyst component are used as **essential components**. As described at column 8, lines 46-52, as the component for adsorbing the oxidized and activated NO_x, particularly NO₂, alkali metals such as lithium, sodium, potassium, rubidium and cesium or compounds thereof and/or alkaline earth metals such as magnesium, calcium, strontium and barium or compounds thereof, particularly the compounds of alkali metals, are effectively used. In fact, the three-way catalyst (d) pointed out by the Examiner includes the alkaline earth metals.

From the disclosure of this reference, it is said that the catalyst system is a NO_x storage catalyst for a lean-burn engine.

In contrast, the present invention is not a NO_x storage catalyst for a lean-burn engine, but is a three-way catalyst operating under the stoichiometric fuel-air ratio. The three-way catalyst is used for purifying exhaust gas from internal combustion engines of automobiles or the like, wherein these gases include carbon monoxide, incomplete combustion hydrocarbon and nitrogen oxide (CO, HC and NO_x) which are purified at the same time and thus contain a noble metal.

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The catalyst system of the present invention **does not include the alkaline earth metals as an essential component** because the use of the alkaline earth metals leads to lowering catalytic oxidation performance.

Thus, the present invention and the reference are completely different from each other in the catalyst system.

However, in order to more clearly define the present invention and distinguish from Tsuchitani, claim 1 has been amended to exclude the alkaline earth metal oxide, namely, the exhaust gas purifying catalyst **consists of** at least one noble metal selected from the group consisting of platinum, palladium and rhodium, and activated alumina, and claim 1 has been further amended to recite that the catalyst layer **consists essentially of an exhaust gas purifying catalyst and silicon oxide**.

As such, Tsuchitani fails to teach or suggest the amended claim 1 and, thus, the invention of the amended claims is novel over the teachings of Tsuchitani. As such, it is respectfully requested that the rejection of claims 1, 2 and 4-5 under 35 U.S.C. §102(b) be withdrawn as Tsuchitani fails to anticipate and/or render obvious the presently claimed invention.

Claim 6 is finally rejected under 35 U.S.C. §103(a) as being obvious over Tsuchitani in view of United States Patent No. 4,759,918 to Homeier et al. (hereinafter referred to as "Homeier"). The Office Action relies on Homeier as teaching the use of metal mesh filters and asserts that it would have been obvious to use a metal mesh support member for solving the diesel emission problem.

For the reasons set forth above, amended claim 1 is different from the catalyst of Tsuchitani, therefore, even if the references, Tsuchitani and Homeier, were combined in the manner suggested by the Examiner, the presently claimed invention cannot be obtained.

RESPONSE TO ARGUMENTS

The Office Action asserts that the arguments submitted in the response dated October 17, 2008 are unpersuasive because claim 1 recites "...said catalyst layer **comprising** an exhaust gas purifying catalyst and silicon oxide, wherein...", that additional components (i.e.,

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alkaline earth metallic oxide, cerium oxide, zirconium oxide) can still be included in the composition. In response thereto, claim 1 has been amended to change the term “comprising” to a more restrictive transitional phrase such as “consisting essentially of” to exclude additional, unrecited components. The Office Action further asserts that even if such an amendment were made, the teaching of Tsuchitani at column 11, line 61-column 12, line 1 suggests that “additional components” such as alkaline earth metallic oxide, cerium oxide, and the like are not essential components. Applicants respectfully disagree as this portion of the reference only suggests that the catalyst may incorporate zirconia and/or the oxide of a rare earth element *other than* cerium. All of the Examples listed in column 12, line 49-column 13, line 40 require either an alkaline earth metal oxide or a cerium oxide.

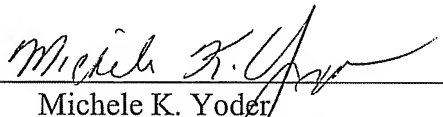
With respect to the peel strength of the catalyst support member, the Office Action asserts that such feature is inherent as long as the claimed components are met. Applicants respectfully traverse this rejection. As set forth above, neither Tsuchitani nor the Shiraishi references teach an exhaust gas purifying catalyst support member consisting essentially of the specific components set forth in the claims. Accordingly, the specifically claimed peel strength of the catalyst support member is not taught nor *inherent* in either Tsuchitani or the Shiraishi references.

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CONCLUSION

In view of the arguments set forth above, the amendment to claim 1, and the addition of new claim 9, it is respectfully requested that this Amendment be entered and all claims in the application, namely claims 1, 2, and 4-9, be allowed and the application passed to issue.

Respectfully submitted,
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